Analogy of Science to Religion.

MACKALL.

ANALOGY

OF

SCIENCE, PHYSICAL AND METAPHYSICAL,

TO

NATURAL AND REVEALED RELIGION.

BY

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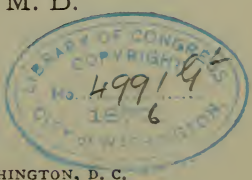

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PREFACE.

The new formula of the Reasoning Process suggested in American Science, and adopted in this Treatise, is calculated to change radically and most essentially the whole of human knowledge, religious and secular. The religious knowledge we have, it must be admitted, is derived in great measure from the indulgence or free exercise of an unrestrained and unbridled imagination. By keeping the imagination in subjection to an enlightened or cultivated conscience, this difficulty in religious knowledge is obviated; and the necessity for introducing the subject of direct inspiration, which has always presented a difficulty to well-ordered minds, is done away with. The subject of miracles, or the temporary suspension of the operation of the Physical laws, which has been used to give authority to those resorting to miracles, is also done away with, since this authority is found in the endowment of the faculty of "knowing

good and evil," that is, of the faculty of conscience, the exercise of which is the crowning act in reasoning.

The Greek Philosophers, in initiating science, and in substituting this for their false religion, committed the same blunder, in accepting the suggestions of an unrestrained imagination as the true principles of science. In this way their science, which has descended to our time, became deeply imbued with the fallacy of materialism, that has rendered this whole system of science irreconcilable to the dictates of an enlightened conscience, or, as it is usually called in American Science, of a good, sound common-sense.

Locke, in his celebrated essay on the "Human Understanding," as he was pleased to call the human mind or soul, which essay has become a standard authority in British literature, committed numerous errors in his reasoning on this subject. His conceptions of human knowledge, and how it was acquired, of simple ideas and how formed, and of the nature of our complex ideas, were all erroneous. The human mind, in gaining its ideas of surrounding objects, is never passive, as a mirror; but, in our waking hours, is busily employed in determining its nerve-fluid or specific life, through the nerves of the senses, to the objects in its environment,

that it may form ideas of these objects and may become aware of their nature. It acquires its simple ideas of such objects by the vital combination of the specific life determined to, with the subtle fluid that is ever passing from, such objects. The mind is thus brought into relation with the material world by means of its specific life, that is in relation with both matter and mind; and the ideas thus formed, and nothing else, can be impressed on the memory so as to be afterwards recalled. Complex ideas are the results of reasoning, that is brought into exercise, or is suggested by our simple ideas. It is from the exercise of the faculty of reason that all useful human knowledge is derived.

"'What is Truth?' said Pontius Pilate, and turned away without awaiting an answer." To this simple question, no plain, definite reply has ever been suggested. Although the inquiry admits of a satisfactory answer, Lord Bacon, who proposed it, came very wide of the mark; and Locke, the next highest authority, in answering it, was equally wide of the truth. His notion, that truth consists in an agreement of ideas, was a partial, and, as it stands, unintelligible answer.

What is Truth? Truth is the dictate of an enlightened conscience, or cultivated common-sense. Conscience or common-sense is a

mental faculty implanted in every sane mind; but is supposed to be more perfect, or more fully developed in the human than in the brute mind. This faculty has received a variety of names in the English language, as, *the knowledge of good and evil*, *the moral sense*, *the rule of right*, *the candle of the Lord within us*, &c., and, when enlightened and cultivated, enables us to behold the truth as it is in the Divine Mind. This is, in short, the spark of Divinity that is imparted to His creatures. Had Locke been aware of this, and had he required his complex ideas, that is, the results of his reasoning, to agree with the dictates of this faculty, as the standard of truth, he would have struck the nail upon the head; but the agreement of ideas among themselves, without any standard of truth, was but a foolish and useless maxim.

ANALOGY OF SCIENCE TO RELIGION.

CHAPTER I.

GENERAL PROPOSITIONS, OR, GENERAL PRINCIPLES OF SCIENCE.

The great aim or grand result proposed in all human knowledge, religious and secular, should be, a correct view, a true theory, of the economy of Nature, that has been aptly called "The Constitution and Course of Nature."

With this acquired, the Human Mind is prepared to accomplish fully the purposes for which it was created. Without this knowledge, the mind of man is ever groping in the dark, and is constantly involved and ingulfed in the quagmires of superstition and ignorance.

A number of views of this all-important subject have been submitted to human intelligence, embraced for the most part in the religious books or systems of religion, adopted by the several nations of the earth; but, more recently, a theory has been offered called "Science," professing to enter more fully and more minutely into the explanation of the operations in Nature or in natural phenomena.

Of the religious books and systems of religion, that which is adopted by what we commonly regard as the most intelligent and most civilized portion of humanity, is the Bible and the Christian Dispensation. These contain the most valuable truths offered to our consideration—truths that furnish a solid and permanent basis or foundation for all useful knowledge. Moses, the Theologian of the Old Testament, relates in the Book of Genesis, "God said, Let there be light," and adds, "and there was light." This reference, of the power and intelligence exhibited in conducting the

Course of Nature, to God its Founder, Law-giver, and Governor, is one of the most valuable truths to which we have just alluded; and St. John the Evangelist, the Theologian of the New Testament, says, "In the Beginning was the Word, and the Word was with God, and the Word was God." Now, if we attach to the term, Word, Logos, the meaning *Laws of Nature*, or the expression of the will of the Creator in words, what was an unintelligible jargon of terms becomes a most important truth that underlies, as it were, all really useful knowledge. The Laws of Nature, as enacted by the Divine Law-giver, are the secondary or proximate causes in all natural phenomena. In the received system of Science, which we shall in future call *European Science*, these secondary or proximate causes are referred to the imaginary, active, *occult properties of matter*, and these forms of matter are looked to as the proximate causes of phenomena, as *the potentials in nature!* This whole system of European

Science is based or founded on the doctrine of Materialism, that refers all the power and intelligence exhibited in nature to forms of matter—a position which, we shall show, is utterly false and untenable. We now propose to offer for consideration an entirely new system of science, to be called *American Science*, which we claim to be more rational than European Science, and more in accordance with the dictates of the conscience or common-sense of mankind.

In the Christian dispensation, it is insisted on, that to observe, obey, and conform to the will of God, as expressed in His laws or precepts, is the condition upon which the human Being or Soul is to enjoy endless happiness in a future state of existence. In American Science it is shown that the same observance, obedience, and conformity to the will of God, as imparted in the laws of Nature, is the condition upon which all His creatures are to enjoy the happiness provided for them in this life; and thus the analogy, the sameness

of law or rule, the sameness of principle in Science and Religion, is established, and shown to be full and complete.

AMERICAN SCIENCE.

In the new system of American Science, the economy of nature is regarded as *a form of government* (the archetype or prototype of all human governments) having God for its Founder, Law-giver, and Governor. Under this government are two classes of Subjects, viz: inert, insensate, and inanimate forms of matter, and constitutions of Mind or Soul. For the government of each class, a separate and distinct class or code of laws has been enacted. For the regulation of the motions and changes of form of inanimate bodies, of which alone are these susceptible, the code denominated *the Physical laws*, are appointed; and to govern the conduct of living Beings in this life, the code called *the Instincts* have been enacted.

It is a noticeable provision in the economy of Nature, that all the power or phys-

ical force exhibited in Nature is connected with, and is derived from, the operation of *the Physical laws* that actuate, or are the secondary causes of, the motions and changes of form of inanimate bodies of matter; and that all the happiness enjoyed by living Beings is connected with and is derived from the operation of *the Instincts;* so that if we would exert a force or power, we must first invoke it by providing the physical conditions necessary to bring into operation some one or more of the *physical laws;* and if we would promote the happiness of a living being, we must bring into operation some one or more of its *Instincts.*

CHAPTER II.

ON PHYSICAL SCIENCE.

The Physical laws, with the operation of which we have said all physical force is connected, are, as far as they have been investigated, fourteen in number, as follow:

At the same time that God said "Let there be light," or, at the Beginning of the World, God enacted the Physical laws, and said:

1st. *Let there be an interchange of the subtle fluid, life, among all the bodies of matter that are in relation with each other throughout the Universe.* In obedience to this law, there has been this interchange throughout nature. In the observance of this First Physical Law the Bodies of Space have continued their ceaseless motion in their orbits and on their axes, and all other bodies of matter have observed the same law, as will be afterwards more fully shown.

This is the physical law of *Interchange of Life* that has hitherto been overlooked by scientists.*

2d. *Let all ponderable bodies about the Earth's surface tend to move towards the center of the Earth.* This is the true law of nature, which was so entirely misapprehended and misrepresented by Sir Isaac Newton. Why do ponderable bodies tend to move in the above-mentioned direction rather than in any other? The answer is plain from what we have said, namely, be-

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*A law, very similar to this, is embraced in the other code of the laws of nature, that is, in the Instincts. The Instincts of Humanity are happily, though partially expressed in the Decalogue, and the particular instinct of which we are treating was well expressed by our Saviour when He said "Thou shalt love the Lord thy God with all thy heart, with all thy mind, with all thy soul, and with all thy strength, and thy neighbor as thyself." To love, is to interchange life with the object loved, whether animate or inanimate, through the Emotional Faculties, or through the Affections; and the strength is always proportional to the quantity of the subtle fluid, the specific life, that is at the disposal of the Mind or Soul. The term, heart, is often used in Scripture figuratively, or as synonymous with that of mind or soul, or, rather, as the secret part or innermost recess of the soul, as the material heart is conceived to be the central or innermost part of the body. Literally, the soul or mind has neither head nor heart—these being members alone of the material body.

cause of the Law of Gravitation, (L. 2,) that was enacted at the Beginning of the World by a Being of infinite wisdom and power. The occult property of Gravity, conceived by Newton, was a mere myth, a fantastic phantasy of Sir Isaac's imagination. There is no such property in any form of matter.

It will facilitate our comprehension of other natural phenomena if we here show the operation of this law in the movements of the pendulum of a clock. The pendulum is pushed from its line of Gravity where it rested, by the hand, or rather, by applying to it the force from the physical law of Muscular Action (L. 12), and is moved in its arc to a distance directly proportionate to the force applied. When this force is exhausted or nullified, the pendulum is carried back towards its line of Gravity by the force from the law of Gravitation, (L. 2;) but, having acquired this new impetus, it does not stop at this line, and is carried beyond it in its arc, until the new force is

exhausted, when it again returns, by means of the same force, towards its line of Gravity. This motion of the pendulum is repeated as long as the force from the law of Gravitation is continued.

3d. *Let all imponderable bodies tend to move towards the outer circumference of the atmosphere.* As the most direct course to this part of the atmosphere is towards the zenith, the impression became general that light or imponderable bodies naturally moved upward, and, no doubt, gave rise to the aphorism that "the mind of man is prone to evil, as the sparks fly upwards."

This is the physical law of Diffusion, that has more to do with the motion of the imponderables, as life, light, heat, electricity, sound, odors, &c., than scientists have suspected.

4th. *Let all adjacent bodies of matter tend to move to fill a vacuum.* This is the physical law of Suction, that furnishes the principle on which all physiological phenomena take place. The motion of the

air into the lungs, of the contents of the primæ viæ, of those of the heart and blood-vessels &c., &c., all occur on the principle of suction, and not on that of propulsion, as heretofore supposed. The force acting on the Hemispheres, or Otto Guericke's cups, is derived from the operation of this physical law, and not at all from *atmospheric pressure*, as is erroneously thought. The force from this law, acting on the body or substance of the cups, and urging them towards the vacuum *within*, is the real motive power in this instance, and furnishes the resistance to their separation.

5th. *When a current of any kind is passing, let the life of adjacent bodies of matter, animate or inanimate, flow from them to swell this current.* This—the Law of the Life-current—is a new physical law, that had escaped the notice of scientists, but will be found useful in explaining many natural phenomena that, without a reference to this law, are inexplicable. It may be used to throw much light on obscure

and unintelligible parts of the economy of Nature. This physical law is the great means employed in nature for the decomposition, and change of form, of material bodies. The *life* of bodies—spoken of as "that mysterious principle of life"—seems to have the effect of keeping in place their several constituents, and of thus preserving their identity; but when the life is withdrawn by virtue of this physical law, these constituents fall into confusion, and are then ready to enter into other combinations and give rise to other forms of matter.

6th. *Let ponderable fluids, or liquids, tend to move towards the spherical outline of the earth, or to the surface of oceans and lakes, which, when calm, constitute in part this spherical outline, and is in fact* THE TRUE WATER-LEVEL. This physical law, which we call *the Law of the Water-level*, has not been properly understood by scientists, who have erroneously referred its phenomena, or the results of its operation, to the Law of Gravitation.

7th. *Let the atoms or molecules of elastic bodies tend to preserve their natural relative position.* The motion of the particles of matter in elastic bodies is caused by this physical law.

8th. *Let the molecules of crystalline bodies, when uniting, be arranged in regular specific forms or crystals.* Every crystalline body or kind has from nature a model on which its crystals are formed. Hauy observed this fact, but failed to account for it, or to furnish its true explanation.

9th. *Let the constituents of inanimate forms of matter be combined in certain definite proportions*, by virtue of this Law *of Chemical Combination.*

10th. *Let material bodies, or their molecules, unite to form distinct masses, or larger bodies of matter.* This Law of Cohesion is the principal means employed in nature, to counteract or annul the force or forces of other physical laws, as occasions require, as we shall presently more fully explain.

11th. *Let the specific life of animants*

unite with the materials of their ingesta, to form the fluids and tissues of living or animate bodies. This Law of Vital Combination is the secondary cause of the formation of organized tissues, which chemists have in vain attempted to imitate. They have failed to command the use of this *specific life*, that is the main constituent in these combinations.

12th. *Let the living muscular fiber, when innervated, be actively elongated and erected; and, when enervated, let it be contracted.* This Law of Muscular Action, as we call it, has heretofore been entirely misunderstood and misrepresented by Physiologists. The reverse of the proposition they have laid down on this subject is true. The action or active state of a muscle is *a state of the active elongation of its fibers*, and *not of contraction of these fibers*, as is erroneously conceived.

13th. *Let certain forms of matter adhere to each other*, as paint to wood, putty to glass and wood, &c. This is the physical Law of Adhesion.

14th. *In the highest orders of both the animal and vegetable kingdoms let a proper union of the two sexes be attended with the formation of a new being; and in some of the lower orders of these kingdoms, let a production of a ganglion or nerve-center be followed by a like result.* This we call The Law of *Animate Generation.*

SCIENTIFIC PRINCIPLES CONNECTED WITH THE OPERATION OF THE PHYSICAL LAWS.

It will perhaps be profitable, as conducive to clearness of thought, to stop here to point out the distinction, the line of demarkation, between two terms that are commonly confounded with each other in scientific treatises. I allude to the terms *Scientific Principles* and *Laws of Nature.* The most essential distinction between these terms is this: scientific principles are the productions, the generalizations of the human mind, arrived at by the exercise of human reason; while the laws of nature are the productions, the enactments of the

Divine Mind, designed to conduct the course of nature.

The scientific principles, connected with the operation of the physical laws, to which I here wish to call attention, are these:

1st. The physical laws in their operation are, at times adjuvant, or assisting each other in accomplishing a result; and, at other times, are antagonistic, or have their forces opposed to each other.

In the perpendicular fall of flowing water into the buckets of the large water-wheel, the force of the Law of Gravitation (L. 2.) (water being a ponderable body) assists, or is added to, the force of the Law of the Water-level, (L. 6,) and both forces serve to accomplish the result—the motion of the wheel. Again, when a heavy, ponderable body falls to the ground, or to the surface of the earth, its motion is arrested by the antagonism of the physical Law of Cohesion (L. 10) acting on the molecules of the earth, which force that of the Law of Gravitation cannot overcome. The force

of the Law of Cohesion, (L. 10,) acting on the earth, is here greater than that of any other physical law, because,

2d. The force of a physical law is always in a direct ratio with the quantity of matter influenced by the law at the time ; and hence, the earth being the largest body of matter with which we are immediately concerned, it follows, from the two scientific principles just cited, that, 1st. The velocity of motion derived from a physical law is inversely as the resistance encountered from the force of some other law or laws ; and, 2d. That the velocity of a falling body is increased with the continuance of motion, by having added to the force of the law causing the motion, that of the Law of Suction, (L. 4,) brought into operation by means of the vacuum formed by the displacement of the body that is moving. From these considerations we learn that Gallileo's experiment at the tower of Pisa was not conclusive, and served to decide the question raised wrongfully. The greater resistance

in the air to the motion of the larger body, and the increase of force in falling, from the Law of Suction, were not considered. The force with which the heavier body moved was undoubtedly greater than that of the lighter body, and this was what the followers of Aristotle based their opinion on; but the velocity of the two falling bodies was influenced by the circumstances stated above that were not taken into consideration.

The mechanic, with a knowledge of the plain and simple truths imparted above, can proceed intelligibly to the exertion of the power in nature—the only power or force he can by any means command. There is no power in light, heat, electricity, steam, nor in any other form of matter; but this attribute of God is "reserved within His own curtain," and is delegated by Him only to a code of His laws—the physical laws—for their execution. The Mechanic should fully realize the truth of the Christian religion that "of himself he

can do nothing," but is dependent on the favor of God for his most trifling acts. He cannot raise his hand to his head, or perform any movement of his body, without first having recourse to a physical law—the Law of Muscular Action, (L. 12,) by means of which law alone, can this movement be effected, and which is the sole secondary cause of this motion. In entering upon the exertion of force, or the construction of a machine for this purpose, the intelligent mechanic should first determine what force, or the force from which of the fourteen physical laws he proposes to employ, and then, by providing the physical conditions necessary to bring into operation this law, he has at his command the force he is about to make use of, and can modify this force in accordance with the scientific principles mentioned above. He determines, for instance, to employ the force from the Law of Gravitation (L. 2) in the use of the trip-hammer, and he raises this ponderable body, the hammer, to a position

whence it can have a free motion towards the center of the earth; and, when it falls, he has at his command the force connected with the operation of this law. He can modify this force by regulating the weight of the hammer, and the distance it is suffered to fall, according to the object or purpose he has in view. Should he determine to employ the force from the Law of Diffusion, (L. 3,) he prepares steam, or some imponderable, diffusible body; if from the Law of Suction, (L. 4,) he has only to prepare a vacuum; and if from the Law of Elasticity, (L. 7,) an elastic body, as a bow or steel spring, and so on; and he can modify or regulate any of the forces, simply by regulating the quantity of matter to be influenced by the law, and the distance it is to be allowed to move.

OTHER FORCES ENTIRELY IMAGINARY.

The Mathematics, or the Science of Equations, has been of great service to mankind; but the mathematicians have,

by the weight of authority, led scientists into many errors and absurdities. We have said there are in nature but fourteen forces or powers; but mathematicians have added to these, other imaginary powers, as, vis inertiæ, the power of friction, &c. When a heavy, ponderable body, as a loaded wagon, rests on the ground, it requires some extra force to start it into motion. This extra force, causing resistance to its motion, is referred to the ponderable body itself, and is called *its vis inertiæ*. The phenomenon is much more rationally explained on the principle stated above, namely, in nature the forces from the physical laws are, at times, adjuvant, and at other times antagonistic to each other. In the instance before us, the force from the first Law of Nature (L. 1) is added to the force from the Law of Gravitation, (L. 2,) and this extra force of (L. 1) must be overcome before the motion of the loaded wagon can be induced, and so on. The scientific principle is true, and serves to

explain all the phenomena. The same may be said of *the force of friction*, wherein the force from (L. 1) is in operation, and causes the remora, or suspension of motion in machinery. On rough surfaces, where the interchange of life is greatest, (for life is interchanged through points or projections,) the remora is greater than on smooth surfaces.

CHAPTER III.

APPLICATION OF THE FORCES DERIVED FROM THE OPERATION OF THE PHYSICAL LAWS TO SOME OF THE PURPOSES OF HUMAN EXISTENCE.

1st. *Let there be an interchange of the subtle fluid, life, among all the bodies of matter that are in relation with each other throughout the universe.* By virtue or by means of this physical law, *ideas* of external material objects are formed and conveyed to the mind. There are two kinds of life in nature—the one of inanimate bodies, that may be called *the life of composition*, and the other of animate bodies, called *specific life*. By the vital combination of the specific life with the life of composition, that by means of a physical law (L. 3) is ever passing among material bodies, *ideas* of such bodies are formed and conveyed to the mind that observes them. This is the Theory of Perception adopted

in American Science; and the vast utility of this physical law in accomplishing this principal purpose of human existence is thus shown. Other important purposes are attained through this law, as chemical combinations, &c., which we will not stop here to enumerate.

2d. *Let all ponderable bodies about the earth's surface tend to move towards the center of the earth.* A valuable purpose is accomplished in the use of the trip-hammer, which use will serve to illustrate the mode in which the force from the operation of this physical law is utilized. The trip-hammer is usually composed of some heavy metal, as iron or lead, that is raised to a proper height by machinery and then let fall, in order to obtain the force of gravitation, or to command the force connected with the operation of this physical law. This force may be modified or regulated on the principle presented above, (p. 15,) by reducing or increasing the weight of the hammer, or the distance it has to fall.

3d. *Let all imponderable bodies of matter tend to move towards the outer circumference of the atmosphere.* This physical law is utilized by mankind in the use of the steam-engine, &c. Steam being among the most diffusible bodies known to scientists, has been utilized in this way: A strong cylinder is prepared in which a piston is made to work air-tight. By applying steam, with its great tendency to diffusion, at one end of the cylinder, the piston is forcibly driven towards its other end, and the force of this physical law is exhibited. This force being then connected with and applied by machinery, constitutes the *steam engine.* Imponderable bodies of matter also tend to be merged into and to become latent constituents of other forms of matter, and consequently their identity is often lost before reaching their natural destination—the outer circumference of the atmosphere—as is seen when the smoke from a steam boiler is dissolved in air. This force is increased in the low-pressure engine by adding

to it that from the physical Law of Suction (L. 4) simply by establishing a vacuum in the cylinder in advance of the piston. The shortest and most direct route to the outer circumference of the atmosphere is in the line towards the zenith; and this has given rise to the common belief that light or imponderable bodies naturally fly upwards.

4th. *Let all adjacent forms or bodies of matter tend to move to fill a vacuum.* When the operation of this physical law is fully understood, it is found that there is not the slightest occasion for the absurd notion of *atmospheric pressure* to explain the phenomena commonly referred to this false principle. In the barometer, for instance, the force by which the column of mercury is sustained in the tube is derived from this law, brought into operation by means of the Torricellian vacuum at the top of the tube, and is not at all influenced by the pressure of the atmosphere on the basin of mercury at its bottom. This is shown in

the action of water pumps, wherein the water is raised, although the pressure of the atmosphere is cut off by the covering of the well.

5th. *When a current of any kind of matter is passing, let the life of adjacent bodies of matter, animate or inanimate, flow from them to swell this current.* This new law of nature, or physical law, we have said, had escaped the notice of scientists; but it will be found of vast importance in explaining many natural phenomena that, without it, are either inexplicable, or that have been entirely misconstrued. When the Abbeé Nollet passed a current of electricity through a regiment of 1,500 men, it was supposed the impression made on each man was a state of action, or proceeded from an active condition, of his muscles. This, however, was an erroneous inference. The specific life—the nerve-fluid—was withdrawn to flow along with the passing current of electricity, and the muscles of the men were thrown into *their state of contrac-*

tion, which, we shall afterwards see, was a state or condition *the opposite to that of their action*. This misconstruing of a natural phenomenon has led to numerous errors in physiology and in other branches of science. The Law of the Life-current (L. 5) is utilized in the use of lucifer matches. The rough surface on which the match is rapidly moved is the life-current into which the life of the paste flows, and its latent constituents, light and heat, are left free to combine and form flame.

6th. *Let ponderable fluids or liquids, as water, &c., tend to move towards the spherical outline of the earth, or to the surface of oceans or lakes, which, when calm, constitute in part this outline, and is, in fact, the true water-level.* This tendency of the movements of such fluids, we have before said, has been misapprehended by scientists, who have erroneously referred it to the influence of the Law of Gravitation (L. 2.) The pressure of liquids in every direction, when restrained in their natural

tendency, or when closely confined, is thus explained.

This physical law is utilized in the employment of what is erroneously called *water-power*, the power being connected with the operation of *the law* here stated, and not at all with *the water*. In the use of this power or force, in mills and factories, it is only necessary to provide a sufficient quantity of water in a dam, with an outlet through which the water can move towards the *water level*. We can then command the force of this law, and can modify this force at will.

7th. *Let the molecules of elastic bodies tend to preserve their natural relative position.* Is it not strange that mankind, in their early savage, uncivilized condition, as well as in their present more refined and more civilized state, should have selected the force from this physical law for the accomplishment of their purposes of securing game and of measuring time, as in

the use of the bow, and of the elastic steel spring in watches and clocks?

8th. *Let the molecules of crystalline bodies, when uniting, be arranged in regular specific forms or crystals.* Perhaps the most remarkable instance of crystallization is to be found in the formation of ice. Here this process may be observed at leisure, and the molecules of water assuming a solid form are arranged in obedience to this law in a strictly regular order in the formation of crystals, each crystal having its own proper angle preserved among its elements or constituents. An immense force is connected with the operation of this law.

9th. *Let the constituents of inanimate forms of matter be combined in certain definite proportions.* In all chemical combinations this definite proportion among the constituents is, by virtue of this physical law, observed. When an acid and an alkali are combined, there is a fixed quantity of both acid and alkali in each salt

produced. The law is utilized by varying the proportions, and by thus having at command the chemicals we desire either for medicinal or mechanical use.

10th. *Let material bodies or their molecules unite to form distinct masses or larger bodies of matter.* This law, we have said, is the great means employed in nature to counteract or annul the force or forces of other physical laws. When a ponderable body, of whatever size or weight, falls to the ground or to the earth's surface, its motion is arrested, and the force, no matter from whence derived, is annulled, because the force from the Law of Cohesion, (L. 10,) acting on the earth or its molecules, is superior to any force we can command. A cannon ball, moved by the force from the Law of Diffusion, (L. 3,) brought into operation by the explosion of gunpowder, is gradually annulled by that from the Law of Cohesion acting on the air, on the water, or on the timbers of a ship, but is at once arrested in its motion if fired at

a bank of earth. This law is utilized by mankind in the same way as in nature, in modifying or in annulling the force from other physical laws.

11th. *Let the specific life of animants unite with the materials of their ingesta to form the fluids and tissues of living or animate bodies.* This process of vital combination is usually termed assimilation. The final result of digestion or assimilation is, the formation or production of *the specific life*, that is applied to so many useful purposes in the living economy—to the purposes of sensation, of motion and of nutrition.

12th. *Let the living muscular fiber, when innervated, be actively elongated and erected, and, when enervated, let it be contracted.* This theory of muscular action serves to explain satisfactorily all the phenomena in nature in which this action is involved, while the received theory fails to furnish a rational explanation in a very large proportion of such phenomena.

The uses to which this law of nature is applied are too familiar and too numerous to require here an extended notice.

13th. *Let certain forms of matter adhere to each other.* I need not dwell on the uses to which this physical Law of Adhesion (L. 13) is applied in mechanics.

14th. *In the higher orders of both the animal and vegetable kingdoms, let a proper union of the two sexes be attended with the formation of a new being; and in the lower orders of these kingdoms, let the production of a ganglion or nerve-center be followed by a like result.*

The phenomena that should be referred to this physical law of animate Generation have been an immense stumbling block to physiologists and theologians, and have given rise to many heated disputes; but this physical law, enacted by an all-wise and omnipotent Law-giver, should serve to settle all such disputes.

With the use of this law of nature Farmers, more than any other class of the com-

munity, promote the enjoyment or happiness of their fellow-creatures.

OF THE SO-CALLED MECHANICAL POWERS.

The Mechanical Powers can only exhibit physical force or power when connected with the operation of one or more of the physical laws. Most commonly this power is derived from the physical law of muscular action (L. 12) and the law of Gravitation, (L. 2.) These are, in fact, devoid of power, but are employed as the means, or appliances, by which power is guided or directed to the parts of a machine where its exertion is wanted. Thus, in a Water-mill or factory, power or force is conveyed to the millstones or spindles by means of wheels and cogs, or by pulleys, &c.—the power in this instance being derived from the physical law of the Water-level, (L. 6.) In the steam engine the power is transmitted from the physical law of Diffusion, (L. 3,) by the same means, to the wheels of the Locomo-

tive or to the shaft of the Steamboat, &c., in order to produce the required motion. These appliances, we repeat, serve to direct and increase force; but in themselves possess no force or power whatever.

OF MOTION.

Motion is the result of an impulse or of an impression of force from some physical law or laws, and may be regarded in the light of a scientific principle arrived at by reasoning; but has nothing of the character of, and therefore cannot be regarded as, *a law of nature*, as some have erroneously thought.

MOTION OF THE TIDES AND OF CONSTANT STREAMS OF FRESH WATER.

The motion of water in tides is derived from the physical law of the Water-level, (L. 6,) which motion ceases not as the law is constantly in operation. Like the motion of the pendulum, when the force that

carries the water in one direction, as towards the surface of oceans, is exhausted, the force that carries the water in another direction, towards bays and rivers, comes into play, and the motion of the water is thus continued. The motion of the tide, (which is nothing more than a portion of water under the influence of the law of the water-level, (L. 6,) having reached the surface of oceans, the water here is raised above the Water-level, and is then returned towards this level by means of the same law which has its force increased by the influence of the law of Gravitation, (L. 2.) In this way the force being constantly kept up, the tides continue, and will continue, so long as these laws of nature are in operation. Thus we have a perpetual motion that has been in operation from the beginning of the world, and will continue to the end of time. The same is true of all constant streams of fresh water as of the river St. Lawrence, the flow of which is sustained by the force from the law of the Water-

level, (L. 6,) assisted by the force from the law of gravitation, (L. 2.)

OF WAVE-MOTION.

This subject is deserving of the more attention, since it has served to give rise to a prominent theory in European Science that professes to account for or to explain a vast number of phenomena connected with the imponderables. I allude to the famous *Undulatory Theory*, that has become very popular and is now generally received as true among European Scientists. We gain a knowledge of Wave-motion best by adverting to what we have said of the movements of the pendulum, and by substituting the horizontal line of the Water-level for the perpendicular line of gravity. What is a wave, of water, for instance? A wave is a portion of water that has received an impetus or impulse from the application of force from some physical law, as from the law of Gravitation, (L. 2,) by the falling of a pebble on a calm surface of water. This

impetus forces a portion of water above the line of the Water-level, and the force being thus exhausted, that of this law is again employed to carry the water back to this level; and we thus have an oscillation of this portion of water, like the oscillation of the pendulum, first in one direction and then in another, the former perpendicular, and the latter horizontal. The top of a wave is called its crest, and its bottom its trough. The distance between the crest and trough of a wave or its size is in a direct ratio with the degree of force applied to this portion of water. When a rock or large stone is dropped into calm water the waves are larger than when a small pebble is dropped. The impulse on the wave when conveyed to the sensitive extremities of the auditory nerves is followed by the determination of specific life through these nerves and the subsequent formation of the *ideas* of sound that are conveyed to the mind. Now, the air and all the imponderables being conceived to be fluids, as well

as water, it is reasonable to conclude that they may all have waves; but to infer from this that the imponderables *are not forms of matter*, but only *modes of motion*, is irrational, unscientific and unphilosophical—is simply a perversion of reason. We might with equal propriety regard water and all metals that are fused as *modes of motion*. That waves are the result of an impetus, or of an application of force, we may be convinced by attending to the fact that waves are produced by the application of force from several of the physical laws as, from a row-boat, from the law of Muscular Action, (L. 12;) from a sail-boat, from the law of Suction, (L. 4;) from a steamboat, from the law of Diffusion, (L. 3,) &c., as well as from the law of Gravitation, as we have seen.

CHAPTER IV.

RECAPITULATION OF THE PRECEDING SCIENTIFIC VIEWS, RELATING MORE ESPECIALLY TO PHYSICAL SCIENCE, THE SCIENCE OF INANIMATE MATTER.

We started out with the general principle or proposition, the truth of which it is presumed will not be questioned, namely, that the grand aim in all human knowledge, religious and secular, should be, a correct view of the economy of nature, or a just account and satisfactory explanation of the phenomena presented in this economy. Such a view had been attempted in the various systems of religion adopted in the early history of the human race. The system of religion now called Grecian Mythology was, however, so absurd, or so at variance with the dictates of common-sense, that certain Greeks, calling themselves Philosophers, rejected this system

of religion and refused credence to its tenets. Accordingly, they initiated an entirely new system, calling it Philosophy, which afterwards became the basis of European Science. From this period of Grecian history to the present time there has been, as might be supposed, an antagonism between Science and Religion, notwithstanding the striking analogy between the two systems that we have just pointed out. The cause of this antagonism is easily explained. Religion was dogmatic and overbearing in its teachings, as it professed to receive its dogmas from the direct inspiration of God; while Science was solely dependent on human reason for its principles, and derided the pretensions of religion. The latter, however, was backed by the masses of humanity, and it became extremely hazardous to call in question a religious tenet, as was shown in the cases of Socrates, Bruno, and Gallileo. Bishop Butler, in his Analogy, very profoundly remarks, "and as it is owned the whole scheme of Scripture is not

yet understood, so if it ever comes to be understood *before the restitution of all things*, and without miraculous interpositions, it must be in the same way as natural knowledge is come at—by the continuance of learning and of liberty, and by particular persons attending to, comparing and pursuing intimations scattered up and down it, which are overlooked and disregarded by the generality of the world.'' To say that the whole scheme of Scripture is not yet understood is the same as to say that this scheme fails to furnish satisfactory explanations of natural phenomena, and consequently fails to answer the purposes of humanity in attaining a knowledge of the economy of nature. A remarkable failure in this respect will be pointed out as we proceed.

Science is certainly the more liberal mode of investigating nature since Religion trammels and restrains its votaries by its pretension to direct inspiration. I have consequently adopted the title of *American*

Science, which, when understood, will be found to furnish a system of religion as well as of science that will be of vast benefit to mankind.

Unfortunately for the interests of truth or of pure science, the Greek Philosophers first gave their attention to physical science, or to the science of matter, and were led to adopt the principles of materialism. They accordingly looked to the forms of matter for the power and intelligence exhibited in conducting the course of nature, or that were presented in the economy of nature. Had they commenced with metaphysical science, and studied carefully the mental endowments with their proper functions, they might have discovered that human reason, when not properly conducted, or when this process was not fully completed, was an unsafe and unreliable guide to truth. *In every instance of reasoning the crowning act should be the exercise of an enlightened conscience or cultivated common-sense.*

With this part of the process omitted, there is no protection against the errors that may be embraced by the human mind, such as everywhere prevail in European Science. It was from a disregard of the mental endowment of conscience, that is possessed by every sane mind, that many errors have been introduced into every system of religion. It is not surprising that the Greek Philosophers, with their unfledged reason, should have fallen into innumerable errors, that have exerted a baleful influence in science down to the present time. It was under such an influence from the error of the *occult, active properties of matter*, that Sir Isaac Newton was led to adopt the false principle of universal gravitation that really has no existence in the economy of nature. The Greek Philosophers taught this false principle, and Sir Isaac, having learned it at college, could not divest his mind of this egregious fallacy, so derived. Had he looked to God and His laws, he might have discovered

the primary and proximate or secondary causes of this motion of ponderable bodies.

We have said on another occasion Sir Isaac reminds us of a raw sailor going to the mast-head and fixing his attention on the objects on deck; and when I see his mind reeling and his reason failing in climbing his dizzy height I feel like calling out with the boatswain, "look aloft! you land lubber!" When the student of nature has learned and can fully realize the truth, that the course of nature is conducted by an all-wise and omnipotent Being, he has accomplished the most difficult part of the lesson he is learning. It was the opinion of the atheist Comté that this conclusion was the result of the exercise of infantile reason alone; but we shall show as we proceed that this is the natural result of all reasoning, adult as well as infantile. This conclusion cannot be avoided by any sane mind that reasons from the natural or physical phenomena that are everywhere presented to its observation.

If, then, science, true, pure science, has for its grand aim in common with religion a true theory or full understanding of the phenomena presented in the economy of nature, the analogy between these subjects of thought is established in this branch of our subject, Physical Science.

CHAPTER V.

OF METAPHYSICS, OR THE SCIENCE OF MIND.

The mind has not a palpable substratum of matter, like the body, of which it can take cognizance; but we only gain a clear conception of the mind through consciousness, that is, by giving attention to the mental endowments, or *faculties* * as they are called, and to their several functions or offices. In the new system of American Science it is held that every living creature, whether of the animal or vegetable kingdom, is possessed of a mind, soul, or spiritual existence, in which is its personal identity and to which are addressed the laws of nature designed to govern its conduct in this life—the instincts; every species of be-

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*In using this term it is necessary to exclude from it all notion of power or force. These faculties are possessed of no power whatever, but are mere capabilities of function.

ing has a mind peculiar to this species, with more or fewer endowments, and with these endowments more or less developed. Perhaps the human mind is more highly endowed than that of any known creature, and we shall take this as our type.

The faculties of the human mind may be divided into three classes, namely, into the Hygienic, the Intellectual, and the Emotional faculties, as they are designed to govern or preside over the bodily functions and those of the Intellectual and Emotional faculties. These mental faculties have all been carelessly investigated and erroneously represented in our books on Physiology and on Mental Philosophy. We will endeavor to give here a more correct account of them.

In animated nature there are two principal objects that are deserving of especial notice, viz: the mind or soul, and the subtle fluid, termed the specific life, or nerve-fluid, which the mind makes use of in accomplishing its purposes. Thus the mind is brought into relation with the material

world, or with the material objects around us, by means of this specific life, which is determined by the mind to objects from which impressions are received, and the *ideas* of such objects are formed and conveyed to the mind. In this way only do we perceive or become aware of the existence of such objects. In this connection it should not be overlooked that the impression comes *first* from the object perceived, and then the mind determines its specific life to the object, before an *idea* of such object can be formed and be conveyed to the mind. The material objects of which we can have ideas, have a subtle life ever passing from them in a state of nature, that makes the impression spoken of. This is the theory of perception adopted in American Science. Before entering upon the consideration of the mental faculties in detail we would call attention to an important provision in nature that seems not to have been fairly understood by scientists. I allude to that part of the economy of nature

commonly treated of under the head of *Association of Ideas*.

All the pleasure, enjoyment, or happiness of living creatures proceed from a due observance of the *Instincts*—the laws of nature designed to govern their conduct in this life. Now there are, in the environment or surroundings of such creatures, objects appointed to suggest to them obedience to, or the observance of, their Instincts —the impressions from each of those objects, suggesting the observance of a particular instinct or law; impressions from articles of food, suggesting the taking of food; from the air, the taking in of air, or respiration, &c., &c. Impressions so derived, we propose to call *Suggestive Impressions*, that may with the greatest benefit to science be substituted for the term *Association* of *Ideas*. These impressions may be attended to or not as seemeth proper to an enlightened conscience or sound common-sense, that is, the governing faculty in every sane mind. Religion, leaving out its pretensions to a

direct inspiration from God, takes a very partial view of the economy of nature, being mainly concerned with the human soul and its future destiny. The *Suggestive Impressions* of which we have been speaking appear to an unsophisticated mind one of the wisest provisions in nature for the promotion of the happiness of living creatures; as they serve to suggest to, or remind creatures of, and prompt them to, an observance of the Instincts—this being the only real source of all happiness; but in religion, and especially in the Christian dispensation, these impressions are regarded as the snares and temptations of the world, and are turned over bodily to the devil, as the means whereby he ensnares human souls and turns them into hell.

The human mental faculties being divided into the three classes—Hygienic, Intellectual and Emotional—and the first class presiding over or governing the bodily functions, the due performance of which constitutes Hygiene or Health, these func-

tions are attempted to be explained in our books on Physiology. Since, however, the discovery of the true law of Muscular Action,* that differs essentially and in toto from the old views on this subject, it is found necessary to change the explanations or theories of these bodily functions. The erroneous principle of *propulsion*, on which these functions were supposed to occur, must be substituted by that of *suction*. In the functions of digestion, respiration, circulation of the blood, of the secretions, ex-

* The great difficulty in accepting our view of Muscular action, that seems to occur most readily to the unreflecting, arises from a misapprehension of, and a consequent false inference from, this view. Can it be conceived, it is asked, that the limbs could be moved by means of a soft yielding substance, as the muscle in the living body? Now, the motion of the limbs, in every instance, is the result of the operation, or of the exercise, of *two sets of muscles*, the Flexors and Extensors, and is never produced by any one set acting alone. Take, for instance, the extension or straightening of the fingers. In this act, both the flexor and the extensor muscles of the hand and fore-arm are employed, and not one set alone, at a time; so that this extension is the result of the employment of both *Flexors* and *Extensors*. But here is the point in dispute. According to my view, in extending or straightening out the fingers the set of muscles that are *in action*, or that are *actively elongated and erected*, are the so-called *Flexors;* while the opposing

cretions, &c., &c., the contents of the tubes concerned, are moved on the principle of suction, and not on that of propulsion—the action of the involuntary muscles about these tubes tending to expand and to induce a vacuum in, rather than to compress and to obliterate, their cavities.

The division of the Muscular System into two classes, the Voluntary and Involuntary Muscles, is right and proper; but the true basis or ground of this classification is not at all understood. The function or office of the mental faculty, the Will, has

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set, the so-called Extensors, are in their *state of contraction*, wherein the nerve-fluid is withdrawn from their fibers, by means of an action in their corresponding nerve centers, and which is not *the state of action* of these Extensor Muscles. In *extending* the fingers the so-called Flexors are *in action*, and inflexing the fingers upon the palm, the so-called Extensors are *in action*, and contribute to this movement of the fingers by their active elongation and erection, that is, *by their action*. Again, the really active state of a muscle, *its active elongation and erection*, which is its true *state of action*, seems not to have been sufficiently attended to by Physiologists. A muscle, in this state, becomes as rigid and unyielding or as inflexible as a bar of steel, as in the muscles of the Index, when this finger is kept firmly extended. Many other instances of the inflexible nature of muscles, *when in action*, or *when erected*, will readily occur to every one.

been entirely misapprehended by scientists generally, and especially by Physiologists. The Will, in itself, exerts no power nor influence whatever over any of the muscles. The sole office of this faculty is to form designs or plans; and such plans, stored in the mind, serve as *suggestive impressions* to induce the mind to exercise the class of voluntary muscles, in order to carry out or to accomplish this plan. I will to walk across the room; that is, I form, by means of my will, the plan to do this; and the mind, if the act is approved of by the common-sense, calls into exercise the voluntary muscles of locomotion to accomplish this plan. In the same way I might proceed to my farm to-morrow on horseback, by steam-boat, or by railroad, simply by the mind preparing the conditions necessary to carry out the purposes I may have in view.

Again, I might form the plan or conceive the design of jumping over the moon, but the mind, possessing no means of ac-

complishing this feat, gives no attention towards its accomplishment. Here, then, the much-mooted question of free-will, is included, as lawyers say, in a nut-shell. The will is left free to form any plan however preposterous or absurd; while every sane mind is possessed of the governing faculty of conscience or common-sense that enables it to determine whether or not it shall give its attention to the accomplishment of the design so presented to it by means of the will.

This is the way Shakspeare puts it:

"Thus conscience doth make cowards of us all,
And the native hue of resolution is sicklied o'er
With the pale cast of thought; and enterprises
Of great pith and moment with this regard,
Their currents turn away and lose
The very name of Action."

OF THE INTELLECTUAL FACULTIES.

The intellectual faculties are either simple or compounded. Among the former are embraced the Observation or Perception, Imagination, Judgment, Conscience

or Common-Sense, Memory, Will, and the Faculty of Language; and the latter class embraces the Reason, and the Invention or Inventive Faculty. Of the Observation we have treated cursorily when presenting our theory of Perception. It may be added here, however, that light makes the suggestive impression that induces the mind to call into exercise its faculty of seeing, sound of hearing, odors of smelling, savors of tasting, and so on, each sense finding in its environment the form of matter suited or appointed to bring it into exercise. Where there is no light the sense of vision is in abeyance; where there is no sound the sense of hearing is not exercised, and so on. The proper suggestive impression must be present or the sense cannot be brought into action.

The imagination is usually exercised in finding new, strange, and pleasing combinations of thought, and much happiness is derived from its proper exercise; but its greatest utility is exhibited in the process

of reasoning, of which we shall presently speak.

The judgment is also usefully employed in the reasoning process, but is commonly used in comparing objects of thought, or such as are found in the world around us. The mathematicians employ this mental faculty in comparing objects, and in establishing their equations—this branch of Science being simply, *the Science of Equations*.

The conscience or common-sense is the ruling mental faculty that is largely developed in the human mind. This is the spark of divinity that leads us to a *knowledge of good and evil*. This faculty, when properly cultivated, enables us to determine at once as to the truth or error of knowledge of every kind, as to what is virtuous or vicious in morals, what is right or wrong in conduct, and to what is just or unjust in our relations with others. This is, in short, the balance-wheel which, in mental machin-

ery keeps every other part of the machinery at its proper work. But for the counteracting beneficent influence of this faculty the imagination would carry off the mind into all sorts of follies and excesses, and society, or the intercourse among beings, would become unbearable. Is it not passing strange that a mental faculty of so high a value, and of so much importance in the living economy, should have been overlooked and entirely neglected in European Science? This simple fact accounts for the innumerable errors and follies contained in this system.

The memory is that faculty by means of which impressions are recorded in the mind, so that they may be recalled from thence as occasions serve. It is not, however, attended to, that no other impressions can be so stored up and recalled, but the *ideas* formed as we have seen, and that are thus brought into relation with the mind. The more plainly stamped on the mind the *idea*, the more

readily is it recalled. The recollection of recently-impressed ideas fails in advanced age, because such ideas are, at that time of life, but faintly impressed on the mind; and all our ideas that are not strongly impressed, "Like Adam's recollection of his fall," or that are not frequently repeated, are soon forgotten, and pass out of the mind.

The will is the faculty that, in the confused notions entertained on this subject in European Science, is supposed to exert a direct power or influence over the voluntary muscles, that causes their action. This is all wrong. The will, being an endowment of mind by the Creator, can exert no power whatever, but its peculiar office or function is, to form plans or designs that serve to suggest the calling into exercise the voluntary muscles. The views on this subject embraced in American Science were so fully set forth, when speaking of the action of the voluntary and involuntary muscles, (p. 60,) that it is deemed un-

necessary here to repeat or to add to them.

OF HUMAN REASON.

We have said, every living being, whether of the vegetable or animal kingdom, is possessed of a mind, in which is its personal dentity, and to which are addressed its instincts; that each species of being has a mind peculiar to this species, with endowments or faculties more or fewer in number, and with these faculties more or less developed. Now, the Reason is so plainly possessed by the human mind that it is thought to be the characteristic of the human race, who are called rational creatures, while brutes are supposed to possess instinct, *blind instinct*, as it is called, as a substitute for reason. This is an error in European Science; for there certainly are both reason and instinct operating on every mind, brute or human; the difference between the two arising from the greater or less

developement of these faculties in the two classes of beings. The human mind is so constituted by the Creator that it has to rely much on its reason, while the brute mind, in which the reason is less developed, is more dependent on its instincts in its ordinary conduct. To regard the instincts, which are the laws of God designed to regulate the conduct of creatures in this stage of existence, as being *blind*, is an utter perversion of language, and an extreme folly on the part of scientists, since it is the guidance of the conduct of His creatures by an all-wise Creator.

Reason is a compound mental faculty or endowment, its function being composed of that of each of the four following simple faculties performed in the order here enumerated, namely: the Observation, Imagination,* Judgment, and Conscience or

* Is it not astonishing, that mankind should allow a subordinate faculty, the imagination, to gain the ascendancy over all the other mental faculties? Not only is this so; but the imagination is suffered to repress and dwarf, as it were, the conscience or common-sense, that

Common-Sense. We have spoken of the Suggestive Impressions from the objects contained in the environment of living beings. Any such object that arrests or serves to arouse attention may suggest to the mind the performance of the function of

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is appointed by Divine Wisdom the ruling faculty of the human mind. This faculty, quaintly called in Scripture "the knowledge of good and evil," has been graciously bestowed on humanity by the Creator, in order that the truth may be discerned, pursued and embraced, and that error may be detected and shunned. Instead, however, of carrying out this wise design of the Divine Mind, Mankind have given heed to extravagant flights of the imagination, a faculty of which Bishop Butler, in his analogy, has remarked: "We are accustomed, from our youth up, to indulge that forward, delusive faculty, ever obtruding beyond its sphere; of some assistance, indeed, to apprehension; but the author of all error." The exercise of the imagination, which Lord Bacon took every occasion to decry, is a most essential part of the reasoning process; but then, its suggestions must always be subject to the ruling faculty of conscience or common-sense, the exercise of which is the crowning act of all correct reasoning. A neglect of this latter important principle of science has been the fruitful source of all error in human knowledge, religious and secular. In religious knowledge especially, the imagination is constantly exercised, and its suggestions, if they come from one having authority, are held as religious tenets, to which the mind is ever after subject, and the truth of which it is not permitted to call in question. In this way humanity is enslaved and chained down, as it were, by its religious tenets, or rather by the imagination; from such dictates of which, it can never be freed while the present condition of things remains, or until we can aspire to a greater freedom of thought, or to a more perfect liberty than is now enjoyed.

Reason. The fall of an apple, the arrangements of the valves of the veins, the different states of the arteries near the seat of local inflammation, and of those remote from this seat in the same subject, have suggested to several minds notable instances of reasoning; and, indeed, the mind is constantly prompted to exercise this faculty by objects with which it is surrounded. Any object that arouses the attention or that is attended with a determination to it of the specific life, is sufficient for this purpose. The two principal aims in all scientific reasoning are, to acquire correct scientific principles, and to discover the true laws of nature. With this knowledge acquired, the mind is greatly facilitated in accomplishing the purpose for which it was created—a proper appreciation of "the Work which God worketh" in the creation.

Instances of the exercise of reason. The falling of an apple from the limb on which it grew, it is said, first suggested to Sir Isaac Newton his reasoning on the sub-

ject of Gravitation. The first step or stage in this exercise of reason was the employment of his observation when his attention was directed to the falling apple; the second step was occupied in calling upon his imagination to find a general proposition, or a scientific principle, that would account for the falling of the apple towards the ground, or surface of the earth, rather than in any other direction. In casting about for such proposition, having learned at college the notion of the occult properties of matter, attraction and repulsion, first taught by one of the Greek philosophers, he very naturally adopted this view, and came to the conclusion that the apple moved in this direction because of this attraction that was inherent in both—the apple and the earth to which it fell The third step in this process of reasoning consisted in the calling into exercise the judgment in comparing all the instances of bodies moving towards the earth, and in judging of their fitness to the proposition

found by the imagination. Consequently he threw ponderable bodies into the air, and explained their motion towards the earth on the same principle. He here, however, had occasion to amend the proposition so as to make ponderable bodies move towards the *center of the earth*. Generalizing the facts, he made all the ponderable bodies about the surface of the earth, including the moon, to be *attracted* towards its center. Then, changing the center of attraction, from the earth to the sun, he made all the planets of our solar system to be attracted towards this luminary; and again changing the center of attraction to the center of the universe, he made all bodies to move towards this grand center, and thus established his theory of Universal Gravitation. This was indeed a vast generalization, calculated to attract the attention and to gain the admiration of Scientists generally. Unfortunately for Newton's reputation it lacked a most essential part of a true principle of Science—truth.

There was not a word of truth in this generalization. The occult properties of matter have no existence in the economy of nature, and nowhere else, than in the prurient imagination of the philosopher who first suggested them and of such as are weak enough blindly to adopt this suggestion. A moment's thought or reflection, or an appeal to common-sense, must serve to convince any one of the folly of such a theory. Neither the earth nor the apple had anything to do with the motion of the latter, but the proximate or secondary cause of this motion was, the law of nature, the physical law of gravitation, (L. 2,) that was enacted by the Creator at the beginning of the world.

Sir Isaac Newton, like the Greek philosophers, stopped short in his reasoning before the process was completed, and consequently fell short of the truth in his conclusion. Had he appealed to the faculty of conscience or common-sense implanted in his mind for the very purpose of leading him to the

truth, he would have reasoned legitimately, and might have detected the extreme folly of the conclusion at which he had arrived. Harvey, observing the arrangement of the valves of the veins, as represented by Fabricius Abaquapendente, discovered the course of the blood in its circulation ; but in giving a detailed account of this circulation he was entirely at fault. The blood is not *propelled* by the heart. The heart is a *suction* organ, and is not an organ of *propulsion*, as Harvey supposed. The contents of the heart and blood vessels, and, indeed of all the hollow organs in the living economy, are moved on the principle of *suction*, and not on that of *propulsion*.

The very striking difference observed in the condition of the throbbing arteries in a finger affected with whitlow, and of the radial artery on the opposite side of the same patient, led to the discovery of the true law of muscular action (L. 12) as offered in American Science,* so widely dif-

*See monogram of The Law of Muscular Action.

ferent from that previously entertained by physiologists. The action of a muscle is attended with *the active elongation* of its fibers, and not by *their contraction*, as heretofore falsely imagined. The active elongation of the fibers arranged about the walls of the tubes or hollow organs, must tend to create a vacuum within these organs, and thus to bring into operation the physical law of suction, (L. 4,) to the operation of which in moving the contents of the hollow organs of the living body we alluded above.

The Invention, or the Inventive Faculty is another compound mental faculty, as its exercise implies a previous exercise of reason in arriving at principles and the laws of nature, without which, means could not be adapted to the attainment of ends—the proper function or office of this mental faculty. The retriever mentioned by Darwin, who, finding he could not manage two crippled ducks at the same time, crushed the neck of one and left it, while he carried

the other duck to the huntsman, and then returned for the one he had left behind, must have had some crude indistinct notions of the principles of physiology gathered from experience. He knew, from his imperfect reasoning, that if the crippled duck were left alone with the posession and control of its nerve fluid, or specific life, that it would employ its muscles in making its escape, and he broke the connection between mind and muscles; he killed the duck by crushing the neck, that he might be more certain of finding the body there on his return. We beg leave to add here the Faculty of Language.

THE EMOTIONAL FACULTIES.

This class of mental faculties is more difficult to treat than either of the others, because these have never been clearly defined, but have been mixed up and confounded with other affections of the mind with which they have nothing to do. The wants, desires, appetites, and propensities

that arise simply from impressions made by means of the objects with which the mind is surrounded, are confounded with the emotional faculties, and so are the passions that are the emotions intensified by means of an excited imagination.

None of these are part and parcel of the mind, as are the emotional faculties, but mere conditions superinduced by adventitious or accidental circumstances. Religion is said to impress itself on the emotional side of the mind, and if we trace the Christian dispensation in its early history, and observe how prominent a position parental and filial affection, that are emotions, are made to occupy, we may be disposed to adopt this view; yet natural religion, which is the true basis of all religion, is clearly the result of the exercise of reason, or of the Intellectual Faculties.

There was in the early history of Christianity much immorality, ignorance, and superstition that found a genial soil in the minds of the enslaved, ignorant, and super-

stitious Jews, that we, in our country, where slavery has been recently abolished, can fully realize; but I fear we are not sufficiently advanced in learning and in liberty to allow of a free expression of the results of reasoning. In all civilized communities where the Christian religion is adopted it is, as yet, hazardous to exercise the reason, particularly so, on points of doctrine already decided in religion. Who dares now to suggest, or even to intimate, that this system of religion may have been the result of the exercise of reason; that it contains errors that clearly indicate its human origin; or that a more perfect system of morality, and a more effectual means of promoting the happiness of living creatures might have been attained simply by attending to the dictates of an enlightened conscience? The Emotions, the Emotional Faculties, or the instincts prompting to their exercise, may be obeyed or indulged in, without sin or blame, if the mind is careful to listen to the dictates of conscience, and thus to

exclude the influence of passion. This truth is asserted in Scripture where it is said "Be angry, and sin not." The sin consists in disregarding conscience, and in yeilding up the mind to unbridled passion. The Emotional Faculties were implanted in minds, and the instincts requiring their exercise were ordained no doubt for the wisest purposes, and consequently there can be no harm in properly obeying these instincts or laws, and in thus promoting the happiness or enjoyment of living creatures.

Love, or the disposition to interchange life; hate, or an indisposition to do this; anger, fear, pity &c., &c., and the affections, parental, filial and others, constitute the emotions; while the sense of the beautiful and of the sublime are conditions of the mind closely allied to passion, wherein a proper control of the mind is yielded up, and the reins are thrown up to the imagination. The pleasure thence arising proceeds only from the indulgence in the

exercise of the latter faculty. The same sensation is excited in the works of the painter, the sculptor, and the poet—all that is necessary is, first to fire or arouse the imagination, and the work is done; the effect aimed at is accomplished.

In closing this hasty and very inadequate account of the mind, let me here repeat the following scientific principles of American Science:

1st. Every living being, whether of the animal or vegetable kingdom, is possessed of a mind, soul, or spiritual existence, in which is its personal identity, and to which are addressed its instincts, or the laws of nature designed to guide its conduct in this life.

2d. Every species of being has endowments or mental faculties peculiar to such species.

3d. Under the guidance of its instincts, each species builds up out of the materials in its environment its own material body.

4th. The portions of a living being most

worthy of consideration are its mind, and its specific life with which the mind operates in accomplishing its purposes.

5th. The principal portions to be considered in the living material body are the nervous system, the muscular system, and the nutritory system. The first for the transmission of the specific life or nerve-fluid through the living economy; the second for the production of motion; and the third for the maintenance and repair of the economy.

6th. The nervous system is also subdivided into the sensory, motory and nutritory nerves, as these minister to sensation, motion, or nutrition.

7th. The muscular system is also subdivided into the voluntary and involuntary muscles, as these are influenced or uninfluenced by means of the will, the plans formed by the will being the suggestive impressions for the action of the *voluntary muscles*, and impressions from the contents of the hollow organs, about the walls of

which this class of muscles are placed, being suggestive impressions for the action of the *involuntary muscles*.

8th. The laws of nature, by means of which the course of nature is conducted as we may observe, are divided into two classes or codes, *the physical laws and the instincts*, accordingly as they are designed to govern or to influence inanimate bodies or minds.

9th. All the power or physical force in nature is connected with the operations of the physical laws, to secure their execution or enforcement; while all the pleasure, enjoyment, or happiness experienced by living creatures is connected with the operations of the instincts, and is derived from obedience to these laws as an inducement to, or as a reward for, their execution or observance.

10th. The human mind, with its compound faculties of reason and invention largely developed, may, if properly trained, be made to reach astonishing results, as we daily observe in the ordinary walks of life.

God has made man superior to every other species of living creatures. With his compound faculties of reason and invention more largely developed, he gains the ascendency over them, and makes all creatures, animal or vetetable, subservient to his purposes. He procures pelts and furs for his comfort from the wildest animals, and ordinary clothing from such as are more accessible. He acquires the power, force, or strength that he needs from the scientific principles established by reasoning, and more directly from animals that can exert more force than he is capable of in his own person, as from a horse, ox, &c., and then by the exercise of the faculties with which he is endowed he is enabled to attain all other objects that may minister to his comfort.

Such of the above objects as are not reached by a cultivated reason, are yet arrived at by experience—which is abnormal or uncultivated reason, such as is employed by the rudest portion of humanity.

CHAPTER VI.

RESULTS OF RECENT EXERCISES OF REASON IN BOTH PHYSICAL AND METAPHYSICAL, OR MENTAL SCIENCE.

I beg the credit may be awarded me of having suggested general propositions and principles that are more rational than those embraced in the received system of European Science. I do not dogmatize. I merely suggest for the convenience of such as are disposed to examine them critically. My propositions are numbered as follows:

1. Every effort at reasoning by the human mind, whether religious or secular, has been directed towards acquiring a correct view, a true theory, of the Economy of Nature, of the Constitution and Course of Nature. Every system of religion that has been adopted by the human intellect has for its grand aim such a theory, and all seem to have failed in attaining this aim.

The system of European Science furnishes also a melancholy instance of such failure. Those who have attempted to explain natural phenomena by means of this system soon become aware of this. The principles of this system of science are utterly false and untenable.

2. The Economy of Nature, or the Constitution and Course of Nature, is best regarded as a form or scheme of government having God for its Founder or Author, its Law-giver, and Supreme Governor. Under this government of God are two separate and distinct classes of subjects, viz: inanimate, insensate, and inert forms or bodies of matter, and animate bodies, or such as are possessed of or influenced by a mind.

3. To govern these classes of subjects two separate classes or codes of laws were ordained at the beginning of the world, namely, the physical laws and the instincts. For the enforcement of these different laws, very different provisions are made in nature. For the execution of the physical

laws power, force, or physical force is appointed, and is connected or associated with the operation of this code of laws; so that this power or force is to be found nowhere else in nature but in this connection; and for the enforcement or execution of the other code, the instincts—pleasure, enjoyment, or happiness is appointed, and is connected or associated with the operation of this code of laws, so that pleasure, enjoyment, or happiness is only experienced in connection with the due observance of these laws.

4. The laws ordained by the Creator at the beginning of the world to conduct the course of Nature, embracing the physical laws and the instincts, are the only true *Laws of Nature*. What are regarded as such in European Science are merely scientific principles established by human reason. The latter are creations of the human intellect; while the former are the appointments of the Divine mind.

5. In the new system of American Science

God is regarded as the great first cause, and His laws, referred to above, are considered the secondary or proximate causes in all natural phenomena. In this way the absurd doctrine of Materialism, wherein the inherent, occult properties of inert matter are regarded as secondary causes, is rejected and is entirely gotten rid of. The mind is thus at liberty to refer to God, to whom is justly due, the power and intelligence exhibited in conducting the course of Nature. This is a fundamental principle of American Science, which it becomes the student of Nature fully to realize or understand. For the power and intelligence constantly observable in Nature we must look to the laws of God and not to the inert forms of matter that can possess no power and no intelligence.

6. In an animate or living body, or such as is in connection with or under the influence of a mind, there are two principal objects that are deserving of special attention, namely, 1st, the mind with its sev-

eral faculties, in which is its personal identity and to which are addressed its instincts; and 2d, the subtle fluid, life, which the mind makes use of in accomplishing its various purposes through its material body. The mind, having no material substratum like the body, is only recognized by attending to the exercise of its several faculties, that is, through *consciousness*, which is the proper term for this mode of attention. The life is a subtle fluid, that is in relation with both matter and mind, and that serves to bring the mind in relation with the material world. This life in living beings is called *specific life*, that is, the life of the species, because it differs somewhat in its nature in every species of being. It is not identically the same fluid in any two species nor indeed in any two individuals of the same species. If we possessed senses sufficiently discriminating, as in some of the lower orders of animals, we might determine the species and individuals by the scent or specific life emanating from them.

7. We have, in this treatise, made a list of the mental faculties, and have given some slight cursory account of their exercises, or of the mode in which the proper function of each is performed. It may not, however, be amiss to dwell further on the most important of these mental functions—that of Reason. The results of reasoning seem to have been but little considered by scientists, for they have confounded with each other such as are totally different in their nature and character. The laws of Nature, as said above, are constantly confounded with scientific principles, when the two are totally different in their nature the one from the other. From the earliest period of the history of Science a very defective and imperfect mode of reasoning has been adopted by scientists, and consequently many gross errors or palpable fallacies have found a place in the received system of European Science. Some of these errors we have taken occasion to point out. In every legitimate instance of

reasoning the crowning act or the final appeal should have reference to the dictates of an enlightened conscience, or good sound common-sense. When this latter part of the process is omitted or neglected, the reasoning is abortive and the conclusions arrived at are unreliable and of little value. The mind is then at the mercy of an unrestrained imagination, like a ship at sea at the mercy of the winds without a pilot and without a hand at the helm. Is it not strange that this mental faculty of conscience or common-sense, which it must be confessed is the most important and valuable of these faculties, should have been overlooked and entirely ignored by scientists? It is also remarkable that this natural Criterion of truth, implanted in every sane mind, should have been substituted by the deceptive and unreliable Criterion of experiment. Experiments may be made to support any theory, however absurd, as we shall presently see; but the dictates of an enlightened conscience are the same in

every well-ordered mind, and are not liable to change. With this Criterion, instead of the hap-hazard, indefinite, and crude notion of direct inspiration commonly entertained, both religion and Science become a perpetual inspiration, being in accordance with the dictates of a faculty implanted in the mind by the Creator.

8. No one, it seems to us, who has given his attention to the plain truths of American Science, can be satisfied with having the occult inherent properties of matter introduced in explaining physical phenomena. These properties are uncalled for and unnecessary, as all such phenomena are fully and satisfactorily explained without their use. The secondary causes at work in these phenomena are much more rationally referred to the laws of God than to such properties of inert matter. The reasoning of Sir Isaac Newton on the subject of Gravitation was faulty in this respect. The experiments he made in support of his theory were inconclusive; as they equally

served to support the very different theory suggested in American Science. Ponderable bodies about the earth's surface tend to move towards the center of the earth because of the Law of Nature, the Law of Gravitation (L. 2) ordained by the Creator at the beginning of the World. This law is the secondary or proximate cause of this tendency in ponderable bodies.

9. Imponderable bodies when mixed with ponderable bodies do not occupy the higher position because of the pressure of the latter; but because of a law of their own—the law of diffusion, that serves to impel them towards the zenith and merge them into the bodies through which they pass. Thus the smoke from a chimney tends to move towards the zenith or outer circumference of the atmosphere, but is soon merged in the air through which it passes. The pressure downwards of more weighty matter is an incidental circumstance, and is not an active cause in the phenomenon. As ponderable bodies are constantly giving

off and receiving imponderables, so the imponderables are constantly being merged into ponderable bodies, and become constituents of the latter.

10. The whole notion of atmospheric pressure, that is so much dwelt upon and employed in European Science in explaining certain physical phenomena, is rejected and expunged from American Science. The Law of Suction, the operation of which is dependent on a vacuum formed, is made to take the place of this absurd notion, since in every instance of so-called atmospheric pressure there is found a vacuum that accounts for the operation of the Law of Suction, (L. 4,) the law requiring that all adjacent bodies of matter should move to *fill* a *vacuum*. The force of this law, acting at the outer circumference of the atmosphere, would counteract or annul the force of the Law of Gravitation acting on the air. The weight of the atmosphere (supposed to be 15 lbs. to the square inch of surface) is removed from bodies im-

mersed, by the counteracting force of the Law of Suction operating at its outer circumference. So that there is, in fact, no atmospheric pressure in nature, as common-sense dictates.

11. From every form or body of matter in the universe there is ever passing a subtle fluid, in accordance with the First Law of Nature, (L. 1,) and this is necessary in order that such forms or bodies should be recognized by living beings; for without this subtle fluid the *ideas* of such bodies could not be formed and presented to the minds of living beings. This view of the economy of nature is new to science; but careful reflection shows that it is absolutely necessary in explaining natural phenomena. On what other ground could it be imagined that we become aware of the objects around us, or that inferior orders of animals are enabled to follow their prey by the scent? This subtle fluid should be understood by the term *life*, as this would serve to divest the word of much of

its mystery, and to give to the term a definite meaning.

12. When a current of Electricity is passed through the living human frame or body, the specific life or nerve fluid may be observed to leave the body and to pass off along with this current of electricity ; and the muscles and other parts of the body, that were distended and erected by means of this nerve fluid, become suddenly contracted and impart the sensation called a shock. In certain delicate chemicals that have their constituents but weakly combined, as nitrate of silver, &c., a current of life passing serves to decompose the chemicals and leave the impression of some of its components, as the black oxide of silver. This is what occurs in daguerreotypes or photographs. If a current of almost any kind of matter is made to pass near a Lucifer match, as in its friction against any rough surface, the paste is decomposed and the light and heat of its constituents are combined into flame. From these and

other like facts we have traced out a new law of nature, a physical law, that we have called *the law of the life current*. This physical law, that is new to science, serves to explain satisfactorily a large number of natural phenomena that, without its use, are either inexplicable or are misconstrued.

13. It is very remarkable that the flow of liquids, as of water, should have been so carelessly and insufficiently investigated by scientists. The motion of water is not governed by the Law of Gravitation, as they have supposed, but by a law of its own, the Law of the Water-level, (L. 6,) that directs this motion, not to the center of the earth, but to its spherical outline, or surface, that is largely occupied by the surface of oceans, and that is the true water-level. The natural flow of water is best understood by adverting to the motion of the pendulum of a clock. When, by the influence of the Law of the Water-level, the water at the surface of oceans is forced above the line of the water-level, it is made to return

to this line by the same influence; and thus we have the flux and reflux of the tides—towards the oceans the ebb, and from the oceans the flood tide. The same is true of the water of streams above tide water. This all assists in forming tides, by pressing the water at the surface of oceans above the line of the water-level, and by thus sustaining or supporting the force of the law of the water-level. For the force, then, with which the water is moved in mills, factories, &c., we must look to this physical law of the water-level, (L. 6,) and not to the Law of Gravitation. (L. 2.)

14. Is it not more rational to refer the phenomena of Elasticity to a physical law than to an imaginary inherent property of elastic bodies?

15. The above question, *mutatis mutandis*, applies equally to crystalline bodies.

16. The Law of Chemical Combination (L. 9) requires that in these unions the constituents should be in certain definite pro-

portions to each other in every such combination.

17. The Physical Law of Cohesion (L. 10) is remarkable for the force that may be associated with its operation, a force that is superior to and that may overcome and annul the force of all other physical laws. The force of a physical law being directly proportional to the quantity of matter influenced by the law at the time, (L. 14,) the force of this law, when acting on the body of the earth, is enormous, and cannot be overcome by any means at the disposal of a finite mind.

18. The Law of Vital Combination (L. 10) is unknown to European Science. The specific life or nerve-fluid is scarcely recognized in this system, and consequently it was found impossible to imitate the vital products that constituted the living body. Neither chemist nor physicist could form a muscle, bone, or ligament, because they could not realize the nerve-fluid or its analogue that was an essential

constituent of these forms. They possessed no means of securing and of controlling this fluid in its combinations, and it was therefore ignored and neglected.

19. The Physical Law of Muscular action (L. 12) that we have so clearly illustrated furnishes another instance of the falsity and unreliableness of the criterion of experiment in establishing a truth in science. Consistently with other parts in the European system, the occult property of contractility was attributed to muscles, and this property was thought to be evinced when the muscle is irritated, which was done by lacerating the fibers. "The flesh will creep when the pincers tear," but it was not considered that this creeping of the flesh indicated both the action and contraction of the fibers. When this irritation acted most on the nerve-center the nerve-fluid was withdrawn from the fibers and they were contracted, and when the irritation acted most on the point irritated, the fluid was determined to the

fibers of the part, and they became *actively elongated*, and were in a state of action, or in their active state. Both the elongation and contraction of fibers were before the eyes of experimentalists ; but they chose to notice only the latter state of the fibers, and to ignore the former state or condition, and thus it was erroneously supposed that the state *of contraction of its* fibers was the *active state* of a muscle.

20. The physical Law of Adhesion (L. 13) ordained by the Creator furnishes a sufficient explanation of the phenomena connected with this subject.

21. The inception of a living being has always been a stumbling-block to Scientists ; but assuredly a law or an expression of the Will of the Supreme Being of unlimited wisdom and power furnishes a sufficient cause and explanation of the phenomenon. The Physical Law of Animate Generation, (L. 14,) as represented in American Science, answers this purpose.

22. The term Instinct, is employed by

Scientists and others with a very indefinite and indeterminate sense or meaning. It is commonly regarded as that part of brutes that corresponds with human reason; but neither the one nor the other of these terms, when so regarded, have attached to it any clear or distinct notion or idea. Reason is not regarded as a mental faculty or as part and parcel of the human mind, for brutes are not allowed to possess a mind, and these terms thus employed are without any meaning whatever. The fact is, that no two words in the English vocabulary have meanings more different from each other. Reason is a compound mental faculty, an endowment of mind; and, in a more or less perfect form or development, is common to all minds; while an instinct is a law of nature ordained by the Author of Nature, that is designed to regulate the conduct of living beings and to prompt their specific acts. Every species of living beings is possessed of a mind with more or fewer endowments, and with these more or

less perfect, and to this mind are addressed its instincts. Every living being is under the guidance of instincts peculiar to its species, and under this guidance forms its own material body and performs all other acts peculiar to the species. A neglect of this instruction from their instincts, is attended with the formation of monstrosities, or *lusus naturæ*, and many other abnormal conditions. Reason being more largely developed in the human mind than in that of brutes, the acts of the latter are dictated mostly by Instincts, while many acts of mankind are prompted by an imperfect mode of reasoning. God has appointed a perfect mode, and has endowed all minds with this, but it is perverted by humanity, and mankind have preferred this perverted mode of reasoning to that appointed by Divine Wisdom. Reasoning, without reference to the dictates of conscience or common-sense, is an abortive effort, that must end in error and disappointment.

23. But besides the laws of nature—the

instincts, under the operation of which all living beings are placed in this state of existence—there are in the environment of such beings certain forms or bodies, appointed by Providence to suggest observance of these instincts or obedience to these laws of nature. Impressions from these bodies are called in American Science *Suggestive Impressions*. This view of the economy of nature is made in this system of Science to take the place of that commonly understood by the term *Association of Ideas*. The Suggestive Impressions are separated into Internal and External, as they arise from the living material body or from External nature.

24. There is no force whatever connected with the instincts; but as "His service" among living beings "is perfect freedom" for the enforcement or execution of this code of laws, the system of rewards and punishments is introduced into the economy of nature. So that for every proper observance of these laws, the sensation of pleasure,

enjoyment, or of temporal happiness is appointed as the reward; and for every neglect or non-observance of such laws the sensation of unhappiness, of suffering, or of pain is inflicted as a punishment. Is it not passing strange that an arrangement or provision in nature so palpable as this, and so constantly pressing itself upon the attention, should have been unnoticed and ignored by Scientists?

25. The human mind, as the type of mind, is divisible into three classes of faculties, namely, into the Hygienic faculties, presiding over the bodily functions and the due exercise of which constitutes health; the Intellectual faculties, of which we have above given a list, and the Emotional faculties, that embrace the Affections. The Instincts enjoin the exercise of each of these faculties, and this is the nearest we can come at a list of the instincts or the closest estimate we can make of their number and character.

The analogy, or sameness of rule or prin-

ciple, in true Science and true Religion is strikingly remarkable in the following respects:

1st. In both Science and Religion God is recognized as the great First Cause in all the phenomena presented in the economy of nature. He hath made all things simply by the utterance of His will. "For His pleasure all things are and were created."

2d. In Science and in Religion, the laws of nature, that are confessedly the laws of God, are regarded as the only secondary or proximate causes in the same phenomena. Materialism, or, as it is sometimes called, Material Science, is thus rejected and spurned, as being utterly false and unfounded.

3d. Inspiration, which, in Religion, is assumed to be the will of God directly communicated to mankind through certain favored individuals, as inspired writers—this communication being imparted *in totidem verbis, et in totidem literis*—is, in science, regarded as the same will, communicated

to all creatures indirectly; that is by means of a mental faculty called conscience or common-sense, with which the mind of every living being is endowed. This monitor, in science, is assumed to teach the truth as it is in the Divine mind; to inform its possessor as to what is good or evil, right or wrong, virtuous or vicious, just or unjust, and further teaches what is proper or improper in conduct. When the dictates of this mental faculty are properly attended to, the mind acts in conformity to the will of God, and consequently answers the purpose for which it was created. Instead of the inspiration in religion, that was imparted to few of the most gifted in the early history of mankind, there is a perpetual inspiration in science, continued down to the present time, through any that are at the pains to properly exercise their reason in the mode appointed by Divine wisdom.

4th. Religion, that is principally concerned with the human soul, teaches that the soul perishes not at death, but is im-

mortal; and after death that it passes into a future state of existence, either of ceaseless happiness or of endless suffering, according to its conduct in this state of nature, the creed, or the belief in the Christian dispensation, going far towards determining into which of these two states the soul is to enter. Science teaches that the soul or mind is common to every living creature, and also that the soul is indestructible or immortal; but the scientist, knowing that he has no ground to proceed upon after death, other than his imagination suggests, rests in the conviction that the future disposal of the soul is beyond his ken. Although from analogy he may conclude that this future state is one of misery or of happiness, he knows that this is not a certain mode of reasoning, and knowing that his soul is at the disposal of an allwise, omnipotent, and most benevolent, Being, he is constrained to exclaim, in view of death, "Not my will, but thine be done, O Lord!"

5th. True religion, after all, is but a

theory of the economy of nature, or of the government of God over the world that He hath created, suggested by the imagination and approved by the conscience, and science is the same theory, suggested and approved by the same faculties, the latter of which is here called common-sense. There is, however, this essential difference between religion and science, namely, that the former, however abounding in ignorance and superstition, has ever been sanctioned by the authority that could be commanded by the peoples or nations by whom it was adopted; while the latter has been made to stand or fall as the results of the exercise of human reason in individuals might justify. The science we have, being false, has taken no permanent hold on the human intellect, and is therefore subject to change, as learning and liberty advance, and must eventually take its position in the lead of religion. The human mind has been, through all ages, chained down to religious tenets, and an order in society appointed to rivet these

chains, and to see that these rivets are kept in order. There are many fallacies in every system of religion heretofore proposed, and the scientist must either implicitly adopt these, however palpable, or be content to be regarded by his fellow-men as being irreligious.

This latter is about as wise a conclusion as that human reason, as heretofore exercised, is, like the Pope, infallible; or that the principles of European Science, as that of gravitation, are unquestionably true.